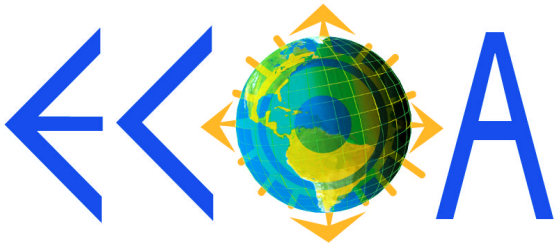


Emissions Overall Summary

Dr. Carol Russo

NASA Lewis Research Center

May 21, 1998

EMISSIONS OVERALL SUMMARY
Where Are We Now?

High Level Goal

- Some Broad Agreement
- Provide Technologies to Remove Environmental Barriers to Growth of Aviation

Scope/Focus

- Three Broad Problem Areas: OD, GCC, LAQ
- Key Emittants Identified (initially) for OD, GCC, LAQ
- Four Broad Technology Systems Identified
  - Propulsion
  - Airframe
  - Air Space & Ground Operations
  - Integration & Modeling

EMISSIONS OVERALL SUMMARY
Where Are We Now? (cont'd)

Specific Emissions Goals:

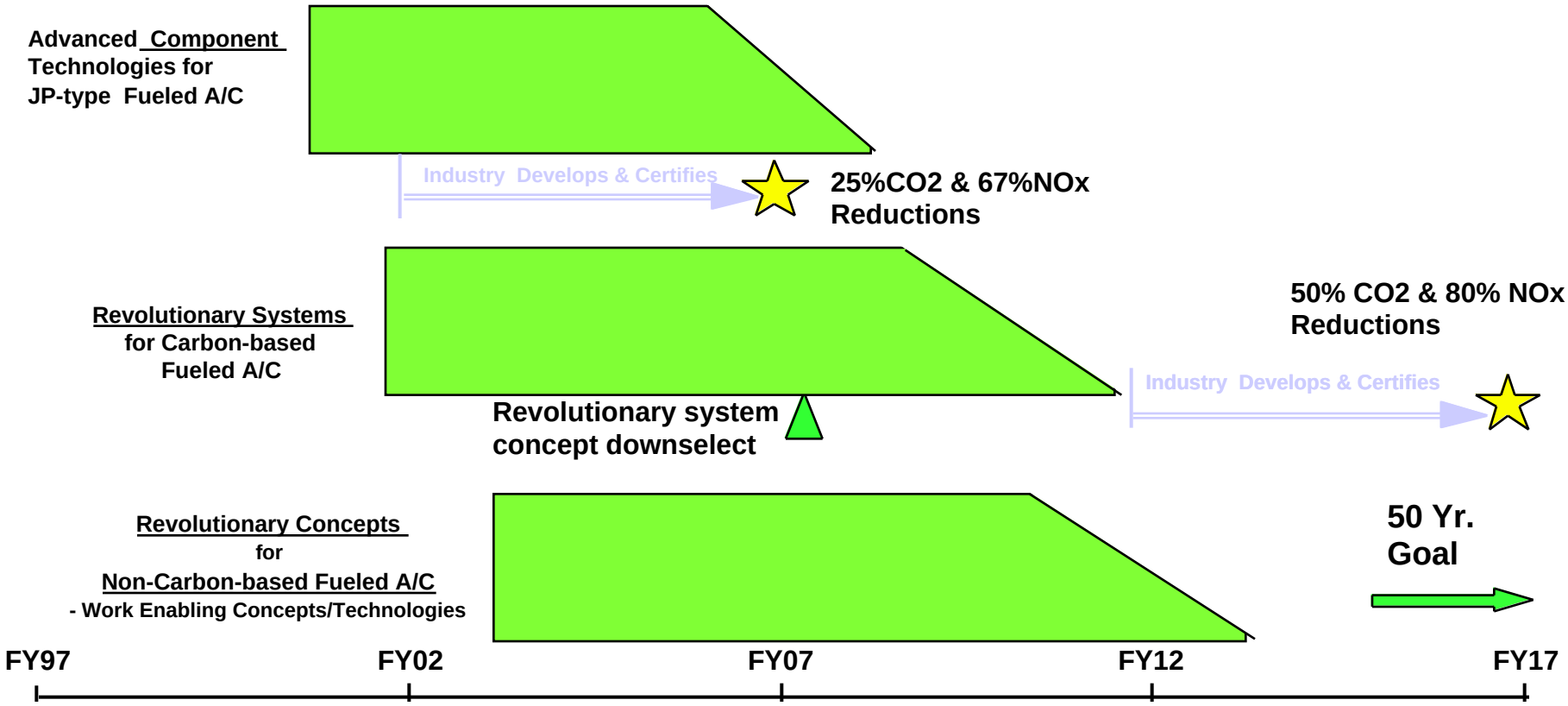
- Generally pushing for maximum reduction practical
- Some Goals Proposed for NOx & CO2

Technology Options and High Level Roadmap

- Broad initial list generated for each technology system: Propulsion, Airframe, Air Space Operations, and Integration & Modeling
- Three timeframes proposed, short, mid & long term, and technologies sorted by timeframe

Potential Environment Emissions Program
Level II Propulsion Element Roadmap

Existing NASA Programs



EMISSIONS OVERALL SUMMARY
Where We Need to Go

- More Work to Define Specific Emissions Goals
  - Systems studies needed to affirm maximum reduction practical
  - Other emittants need to be addressed (other than NOx & CO_2)
- Process Needed to Generate more Technology Options
- Systems Studies Needed to Evaluate/Prioritize Technology Options
    - Cost vs. Benefits
    - Figures of Merit
- Map Technology Options into Potential Benefits in OD, GCC, LAQ
- Map TRL in Gap Analysis
-

EMISSIONS OVERALL SUMMARY
Where We Need to Go (cont'd)

- Show the Relationship Between Single Aircraft Improvements & Specific Emission Goals and Potential Public Benefits
- Need More Input from Atmospheric Community
- Need to Understand which Noise Technology Options Have Potentially Negative Impact on Fuel Burned and Work Synergistically